

ON THE OCCURRENCE OF A STARFISH IN THE UPPER SILURIAN SERIES OF BOWNING, N. S. WALES.

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STARFISH have not so far been recorded from the rich fossiliferous deposits of Bowning, nor was I cognisant of their presence in those rocks until Mr. John Mitchell presented a specimen to the National Collection.

The rarity of this form of life in the Bowning rocks must plead my excuse for describing so fragmentary an example as that now referred to. The specimen is interesting, not only on this account, but also from the fact that it may possibly belong to one of two by no means common genera of Upper Silurian age—*Palæocoma*, Salter (*non*. D'Orb), or *Palasterina*, McCoy.

As now preserved, the Starfish consists of portions of three rays and traces of the interbrachial disk, with the actinial surface exposed. The ambulacra are deep proximally, but become faint distally. The ambulacral plates are not clearly distinguishable, but the margins of the valleys are bordered by a row of adambulacral plates, quadrangular and distinct, although the presence of an outer row is questionable. Combs of rigid spines are attached to the arm edges, of whatever construction they may be. The mouth is very large, strongly pentagonal; the oral plates large, triangular, and apparently of one piece each, instead of two, as should be the case in a true *Palæocoma*. The arms are united by a disk broken up by a series of anastomosing lines, giving rise to the appearance of a polygonal-plated integument when pressed together, but in a normal condition squamose, as seen through the oral cavity. From the margin of the disk stream fine long spines that in all probability covered the whole of the dorsal surface.

It must be at once admitted that, without a more definite knowledge of the ambulacral plates, and in the face of single instead of double oral plates, the reference of this form to *Palæocoma*, Salter, is open to doubt; but the presence of the disk with its squamose plates, laden with spines, seems to place our fossil nearer to that genus than to any other. The only other genera known to me that it appears to approach are *Edrioaster*, Billings; *Schenaster*, M. & W.; and *Palasterina*, McCoy. As regards the first-named,* the form of the arms, and nature of the disk, are characters sufficient for separation; whilst the form of the adambulacral plates in the second† genus are likewise distinct.

* Canadian Org. Remains, Dec. iii., 1858, p. 82.

† Illinois Geol. Survey Report, ii., 1866, p. 277.

With *Palasterina** there is a resemblance in the quadrangular adambulacral ossicles bordering the ambulacra, but the difficulty is increased by the absence of certainty as to the presence or not of a second row of plates, *Palasterina* having but one row, whilst *Palaeocoma* possesses two. At the same time there are unquestionably combs of spines along the edges of the ambulacra, which would favour the presence of a second row of plates as in the latter genus. Furthermore, the appearance of the disk is much more akin to that of *Palaeocoma* than *Palasterina*, and on the whole it appears to me preferable to refer the Bowning fossil to the former genus rather than to the latter.

A difficulty now presents itself with regard to the name *Palaeocoma*. Salter proposed it in 1857,† although D'Orbigny had previously suggested it‡ for the Lias *Ophiura mülleri*, Phillips; but, according to Zittel,§ even D'Orbigny's name is in part a synonym of *Ophioderma*, M. & T. No other reference to this double use of *Palaeocoma*, except that of the late Dr. Thomas Wright,|| has come under my notice, not even in Dr. B. Stürtz's excellent review of "Fossil and Living Starfish."¶

Under these circumstances, and with the object of avoiding this confusion, I propose to substitute the name *Sturtzaster* for that of *Palaeocoma*, Salter, in honour of Dr. B. Sturtz, of Berlin. To the present fossil I propose applying the specific name of *mitchelli*, and if therefore it be correctly referred to *Palaeocoma* in the first instance, in the future it must be known as *Sturtzaster mitchelli*.

The specimen is from the Upper Trilobite bed of the Wenlock Series at Bowning, N.S. Wales.

In 1880, the late Prof. Alleyne Nicholson and the Writer proposed** the genus *Tetraster* to take the place of *Palaeaster*, Salter (*non*. Hall), Salter's conception of this genus being antagonistic to Hall's later definition.†† More recently Dr. Sturtz has proposed,‡‡ apparently for a similar reason, the name *Salteraster* in the same sense, and to which the date 1886 is attached; it is clear that our name has precedence.

* Brit. Pal. Foss., Fas. i., 1851, p. 59; Salter—Ann. Mag. Nat. Hist., (2), xx., 1857, p. 327.

† Salter—Brit. Assoc. Report 1856 (1857), pt. 2, p. 77; Ann. Mag. Nat. Hist., (2), xx., 1857, p. 327.

‡ D'Orbigny—Prodrome, 1850, i., p. 240.

§ Zittel—Handb. Pal. i., Abth. 1, p. 445.

|| Wright—Mon. Brit. Foss. Echinod. Oolitic Form., ii., 1, 1863, p. 29; *Ibid.*, ii., 2, 1866, p. 143.

¶ Stürtz—Verhandl. Nat. Vereins Rheinlande, L., 1893, p. 1.

** Mon. Sil. Foss. Girvan in Ayreshire, 1880, pt. 3, p. 324.

†† Hall—20th Ann. Report N. York State Cabinet Nat. Hist., 1867, p. 282.

‡‡ Stürtz—Verhandl. Nat. Vereins Rheinlande, L., 1893, p. 42.